This paper was written by Beverly Merrill for a graduate level class at Syracuse University. It is designed to be used as an interactive computer-based tutorial.

Tutorial for

A Framework for Understanding the Strategic Use of Information Resources

This tutorial will acquaint you with some overarching elements of information resources (IR) and provide you with a framework to analyze issues associated with IR and information technology (IT) and make IR/IT decisions that are strategically based.

As a review, and to ensure we are thinking along the same lines, some definitions are in order. The term 'information' can be defined as " knowledge communicated, ... received, ... [or] gained through ... [conversation,] study, research, etc."[1]

Information technology (IT) is "any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information."[2] IT can "be conceived of broadly to encompass the information that businesses create and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information."[3] IT has moved from providing support to back-office functions (payroll, accounting, and so forth) to "a strategic business component, enabling the redefinition of markets and industries and the strategies and designs of firms competing within them."[4]

Strategy can be defined as "a set of objectives, policies, and plans that, taken together, define the scope of the enterprise and its approach to survival and success."[5] Top-level direction of business operations (a strategy) "...evolve from an incremental adjustment to unfolding events."[6] Strategy is a process that continually evolves over time. It is the integration of thinking about the successful functioning of business processes, understanding all the areas that impact those processes, gathering information about the organization's environments (internal and external), capitalizing on opportunities, and knowing what your competitors are doing, that becomes 'strategic thinking.' Strategic thinking clarifies the future direction of the organization, maximizes the value of the business, helps establish the organization's priorities, assesses risk, improves decisionmaking by focusing on key issues and challenges, benefits everyone in the organization, and makes you a better leader and manager. A strategy can be planned (deliberate strategy) or it can emerge from inside the business usually with technology driving it (emergent strategy). A strategy can also be position in the market as compared to other companies or it can accomplish internal high level objectives.

As organizations move toward the next century, IT and IR need to be seen as strategic resources -- resources that can positively change the business, drive the business toward higher goals, and strategically place it against competitors. IT can also open up opportunities for new products and services that can support the strategy. However, IT and IR alone do not make the strategic difference. It is the effective, deliberate management of these that make the difference.

Part of effective, deliberate management of IR/IT is continuously looking at existing business processes for areas of improvement to reach and sustain maximum efficiencies and effectiveness. Before spending business dollars and using other resources on IT, business processes must be changed or redesigned to become more efficient (competitive). Organizations must analyze their processes prior to making an IT investment because that investment may not be needed. To maximize processes, you, as one of the organization's leaders, need to know where your organization is situated in today's world, what the external and internal environments are, and most of all where the organization needs to be in 5 to 10 years -- the vision. Any leader " that is a bystander on the road to the future will watch its structure, values, and skills become progressively less attuned to industry realities."[7] Once the processes are efficiently operating we can look for new technologies that can be infused to gain more efficiencies and competitive advantage.

To strategically integrate IR/IT into the business processes, other information needs to be gathered and analyzed. The remainder of this section of the tutorial will describe -- in mile-wide, inch-deep terms -- what information to gather and analyze in order to further understand and make decisions on the strategic use of IR/IT.

Organization Background. To gain the broadest view possible of the organization, we need to know the history behind the particular industry; the background of how the organization business was developed; the organization's structure and its core processes; the organization's vision, goals, and objectives; and what the leadership is like and its management style. These will form a context in which the remaining areas can be analyzed.

External Factors. External factors may have an affect on the organization by determining business profitability. These factors include changes in the world economy, new competitors, new rules for competition, demographics, social values, new and evolving technologies, increasing customer expectations, new political agendas, and government regulations. Once you determine what is happening in each of these areas and determine which are negatively impacting the organization, methods to counter them can be developed -- this problem solving will become part of the strategy.

Business Details. It is important to know who the stakeholders are and what they want from the business. Getting stakeholders involved in strategy building will gain their support. Knowing the organization's culture is also important. A culture aligned with the strategy will not be a barrier to implementing change. The current financial state is important in decisions involving expenditures. Also, knowing the details about what contrasts your business from other similar businesses will help to improve negative areas and emphasize positive areas.

Business Issues. The analysis of how the external and internal factors impact on the business and create issues is dealt with here. Additionally, there are some invisible assets that could become issues if not aligned with the strategy: The proposed process or business changes must continue to support any alliances with suppliers and distributors and, especially, support customer loyalty. Changes (including IT infusion) must also support core competencies and, at a minimum, maintain product and service reputation and brand image.

Information Resources -- Information Technology -- Information Systems (IR/IT/IS)

As you know, the use of IR/IT/IS has great potential to alter business processes and the potential to create new value-added information-based products and services. Knowing the industry and business history, current state of the business, and external and external issues, help leadership at all levels to understand how and why infusing IT or changing existing IR/IT/IS impacts on business processes. Front-line managers or their employees are closest to the processes and may see an opportunity before higher level managers. On the other hand, higher level managers see a larger picture of the business processes and may broaden a smaller IR/IT/IS idea and apply it in a wider scope.

Five areas can be used to assess the impact of IT on the business strategy: "...barriers to entry; build in switching costs; change the basis of competition; change the balance of power in supplier relationships; generate new products."[8] If the organization can gain an advantage in one or more of these areas, that becomes a strategic resource.

As one of the organization's senior executives, you must know what the existing IR/IT/IS are and how they operate within the business. Also, you need to consider any existing IT architecture (framework). " The IT architecture provides an overall picture of the range of technical options available to a firm, and as such, it also implies the range of business options."[9] New or expanding IR/IT/IS need to follow this architecture to ensure systems integration and interoperability.

The next step is to look at the proposed IT/IS change. To support or link to the organization's strategy (upwardly alignment), the IT/IS will solve one or more of the business issues previously discussed and capitalize on existing business assets. The IT/IS change should also establish or increase competitive edge. Analysis of the impact of competitive forces on the organization should indicate that the proposed IT/IS has a strategic use against one or more of these forces (such as new competition). [Note: An analysis of the cost of IR/IT/IS implementation against the short and long-term benefits can be used in decisionmaking and to "sell" the IT investment to stakeholders.]

Finally, do not forget to consider two more invisible assets. Our employees are highly motivated, experienced workers, and contribute greatly to business success. How will the IT/IS change impact them? How will it impact current management practices and the organization's culture? Any impact needs to be a positive one to remain aligned with the strategy and keep the competitive edge moving forward.

<u>Outsourcing</u> is another area to consider when looking at the strategic use of IR/IT/IS. It may be more beneficial to outsource some of the IR/IT/IS if there is not in-house expertise. Also, the organization may want the IR personnel to concentrate on strategic IT versus supporting legacy systems. If outsourcing is used, remember to allocate implementation risk between the business and the outsourcing partner.

<u>Implementation -- Risk Assessment</u>. Implementing the IR/IT/IS change can go smoothly or it can fall apart, depending on the planning effort, leadership support, and accountability. A good implementation plan, with allowances for modifications, is necessary, along with implementation goals and objectives aligned with the strategy. A prediction of the implementation risk of the change can be developed at the beginning of a project. Key factors for implementation prediction include the organization's experience with the size of the project; experience in fielding the project; and clear outcomes (performance measurements). [See further discussion on performance measurements below.] If the project is large, it can be implemented in phases, each phase addressing one specific function of the IT/IS. Using commercially available equipment and software (versus development) and testing a prototype are also helpful. Critical success factors have a great role here: What must be true of the new IS for it to work well?

Another part of implementation is to consider the risks to the invisible and other assets. Implementation should not negatively affect the culture, values, power and reporting structures, reward systems, sponsorship, and so forth. Employees should accept and adapt to the change(s) without objections. They should also want to use the new IS. If they do not use it, there is less value in the change and to the business. Leadership needs to act as a change agent in providing support for and leadership of implementation.

<u>Opportunity costs.</u> After implementation, someone usually asks why that money was spent when there may have been an alternative. Therefore, consider what could be done instead of this

particular IT/IS and evaluate the alternatives. Also, look at what could be done in addition to this IT/IS (for future planning).

Performance Measurements. Measuring the performance of the IS after implementation and comparing it with the business performance before the IR/IT/IS change will give part of the value added. What outcomes are expected once the IS is in place (outcome-oriented performance measurements)? What output is expected of the IS (output-oriented performance measurements)? Measuring performance of the changed business processes will give the other part of the value added.

Quality Management. In looking at the strategic use of IT, a senior executive should also consider quality management (QM). QM "means...an organization's systematic efforts to transform the cornerstone of quality into an integrated framework that management and the workforce use in short-term decision-making and long-term planning." [10] Quality management must be integrated into the organization's business (including the strategic use of IT) and it must change as the business processes change.[11]

Alignment. This tutorial has already mentioned alignment but it needs to be emphasized again. It is imperative that whatever IR/IS/IT change is made be in consonance with the business strategy and vision. It is further an imperative that the IR/IS/IT change be in consonance with the official (visible) and unofficial (invisible) assets of the organization. The change must also connect with business processes, human resources, management practices, reward systems, informal and formal power structures, the organization's culture, and employee values. Managers at all levels must also demonstrate their commitment to creating strategies that are aligned with the organization's core values: genuine respect for employees, individual accountability, a commitment to treat employees as organization assets, empowerment, good incentive programs, and support for personal growth.[12] All the companies that have survived throughout the years have had strong upward and downward alignment.

Balanced Scorecard. The Balanced Scorecard places strategy and vision at the center of the organization. Collecting the information to build the scorecard enables a organization to link its financial budgets to its strategic goals.[13] Using the scorecard enables the organization to manage the implementation of the strategy but also allows the strategy to evolve in response to changes (the simultaneous revolutions).[14]

Summary

Your time, commitment, leadership, and expertise are required to both manage and lead this organization in today's and tomorrow's competitive environment. You " must firmly believe that the massive investment [you are about to make in IT] will provide the …[organization] with sustainable proprietary advantages."[15] You, as an organization executive, must firmly believe that the IT investment will lead the organization toward the vision and that this investment links to, and/or supports the goals and objectives of the strategy that is in place to reach the vision.

Remember, it is not the technology alone that will make the difference in an organization. It is the capability of the organization to effectively and innovatively use the technology to support its strategy. Also, it is how the technology is integrated into the organization's mission, goals, and values that make a difference. As a senior executive and business leader, you must anticipate all the factors that may negatively and positively impact the business, be ahead of them (think strategic), and control them to maintain that competitive edge. " It is a purposeful, effective, active management technique..."[16] that makes a good organization or business into the best.

Note: Pursuing the 'ultimate' strategy is probably unrealistic. It is better to have a second best strategy that can be successfully implemented than a best strategy that is not.[17]

An outline of this Framework for Understanding the Strategic Use of Information Resources follows after the footnotes.

Footnotes

1. Random House Webster's Dictionary, Random House, New York 1993, p.241.
2 Clinger-Cohen Act of 1996, Public Law 104-106, section 5002.(3).
3. Porter, Michael e. and Millar, Victor E., "How Information Gives You Competitive Advantage," Harvard Business Review, July-August 1985, Boulder, CO, p. 149.
4. Applegate, Lynda, McFarlan,F. Warren, and McKenney, James L., Corporate Information Systems Management, Times Mirror Books, Chicago, 1996, p. 135-136.
5. Mintzberg, Henry, Quinn, James, and Voyer, John, The Strategy Process, Prentice Hall, New Jersey, 1995, p. 126.
6. Mintsberg, p. 74.
7. Hamel, Gary and Prahalad, C.K., "Competing for the Future," Harvard Business Review, Volume 72, Issue 4, July-August 1994, p. 124.
8. Applegate, p. 53.
9. Applegate, p. 137.
10. Hyde, Al, "A Decade of Quality Management" Government Executive, July 1997, p. 58.
11. Hyde, p. 58.
12. Ghoshal, Sumantra and Bartlett, Christopher, "Changing the Role of Top Management: Beyond Strategy to Purpose" Harvard Business Review, Volume 71, Issue 6, November/December 1994.
13. Kaplan, Robert S., and Norton, David P., "Balanced Scorecard - Measures that Drive Performance," Harvard Business Review, January-February 1992.
14. Kaplan and Norton, "Using the Balanced Scorecard as a Strategic Management System," Harvard Business Review, January-February 1996.
15. Applegate, p. 160.
16. Mintzberg, p.127.
17. Dr. Jeffrey Katzer, Syracuse University, 25 July 1997 lecture in Washington, DC.

Outline for A Framework for Understanding the Strategic Use of Information Resources

Are business processes at maximum efficiency and effectiveness (without the infusing of (more) information resources or information technology?

History: - industry - organization
Structure and core processes.
Vision, goals, and objectives.

What leadership is like; its management style (do they motivate, facilitate, communicate, and so forth).

External Factors. These determine business profitability and include :

World economy	New and evolving technologies
Demographics	New rules for competition,
Social values	Increasing customer expectations
New competitors	New political agendas

Regulations

How the organization can counter external factors [becomes part of the strategy]

Details of the business (internal factors):

- What contrasts it from other similar businesses?
- What people have an impact on the business?
- Who are the stakeholders and what do they want from the business?
- What is the culture?
- Are there any traditions embedded in the business culture?
- What is current financial state?

Business issues

- Dealing with external and internal factors which have created issues.

Information Resources - Information Technology - Information Systems (IR/IT/IS)

- Assess the current IT/IS/IR.
- Is there an IT architecture (framework) related to the current IS?
- What is the IT proposal? How did it get started?
- What business issue(s) does it solve (a value-added)
- What business processes does it alter?
- What is the impact on other organization programs and other IR?
- Does it capitalize on the existing business assets?
- Does it give or increase competitive edge?
- Do the benefits outweigh the costs?
- Does is support the organization's strategy (upwardly alignment)?
- Does it have potential to create new value-added information-based products and services?
- Does it open up new opportunities that may support the strategy and in this way have IT drive the business?
- Is it upwardly aligned
- Impact of competitive forces on the proposed IS
- Is there any strategic use of the IS against these forces (economic changes, social values, demography, regulation, and technology)?

Assess the impact of IT on the business strategy

Does it give barriers to entry?
Does it build in switching costs?
How does it change the basis of competition?
Does it change the balance of power in supplier relationships? Is this good or bad?
Will the new IS eventually support the creation of new products or new services?
What are other similar business doing in this area - do a competitive analysis

Outsourcing

What are pros and cons of outsourcing the process that the IS will support?
Is there any advantage of outsourcing parts of the process or IR?

Implementation - Risk Assessment

- What is the prediction of the implementation risk of the IS and related changes?
- Does the organization have experience with the size of the project?
- Do we (or our outsourcing partner) have experience in fielding the project?
- Are there clear outcomes (performance measurements)? [see topic below]
- Is there a sound implementation plan with allowances for modifications?
- Are there well thought out goals and objectives for implementation?
- Is there a well thought out strategy for implementation?
- What are IT issues that need to be addressed to begin to field the IS?

Critical Success Factors What must be true of the new IS for it to work well?

Opportunity costs:

What could be done instead of this particular IS?
What could be done in addition to this IS?

Performance Measurements

What outcomes are expected once the IS is in place (outcome-oriented performance measurements)?
What output is expected of the IS (output-oriented performance measurements)?

Alignment

Is there downward alignment? [Top leadership advocacy for the strategy]
Is there upward alignment? [front-line level is aligned with goals of the next higher level, and so forth]

Balanced Scorecard

Is it being used to link financial budgets to strategic goals?

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